

BEAUMONT HEALTH GUIDELINES FOR CYTOGENETIC/MOLECULAR TESTING OF HEMATOPOIETIC MALIGNANCY

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With the expanding discovery of new genetic markers, it became imperative to have a test protocol in place to ensure compliance with NCCN guidelines and WHO guidelines. Thus, a multidisciplinary committee was formed by Beaumont Laboratory to standardize cytogenetic and molecular testing for hematopoietic malignancy across the hospital system. This Laboratory Bulletin summarizes the current testing protocol and ancillary tests that will automatically be ordered by the pathologists in all new diagnoses of hematopoietic malignancy.

Laboratory Bulletin

B Lymphoblastic Leukemia/Lymphoma	<ul style="list-style-type: none"> • Karyotype • ALL FISH Panel [4,10 trisomy, t(9;22), 11q23 rearrangement, t(12;21), t(1;19), IGH/IL3 for t(5;14), iAMP21, ABL1, ABL2, PDGFRB per Children's Oncology Group protocol] • RT-PCR for BCR-ABL1 • Send out for Phil-like ALL FISH Panel testing (MAYO), at ordering physician request only
Acute Myeloid Leukemia, including evolving AML	<ul style="list-style-type: none"> • Karyotype • Limited AML FISH Panel [CBFB gene rearrangement for inv16/t(16;16), p53, t(15;17), MLL, t(9;22), NUP98] on all • Expanded FISH panel upon request to also include t(8;21) and 3q26 rearrangement • Next Generation Sequencing - Myeloid Panel • FLT3
Myelodysplastic Syndrome	<ul style="list-style-type: none"> • Karyotype • Next Generation Sequencing - Myeloid Panel • FISH only upon request or at discretion of pathologist or if traditional karyotype obtained <20 metaphases [MDS FISH Panel: trisomy 8,del(20q),monosomy 5/del(5q),monosomy 7/del(7q),3q26 rearrangement, monosomy 13/del(13q), MLL,p53]
Myeloproliferative Neoplasms	<ul style="list-style-type: none"> • Karyotype • FISH or RT-PCR for BCR-ABL1 • JAK2 V617F, if negative CALR, MPL (ET and MF) and JAK2 Exon 12 (PV)
Myelodysplastic/Myeloproliferative Neoplasms including Chronic Myelomonocytic Leukemia	<ul style="list-style-type: none"> • Karyotype • FISH or RT-PCR for BCR-ABL1 • JAK2 V617F, if negative CALR and MPL • Eosinophilia FISH Panel [FIP1L1/PDGFRB, PDGFRB, FGFR1 and JAK2 rearrangements] • MDS FISH only upon request or at discretion of pathologist or if traditional karyotype obtained <20 metaphases [MDS FISH Panel: trisomy 8,del(20q),monosomy 5/del(5q),monosomy 7/del(7q),3q26 rearrangement, monosomy 13/del(13q), MLL,p53]

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Eosinophilia associated with myeloid/lymphoid neoplasms	<ul style="list-style-type: none"> Eosinophilia FISH Panel [FIP1L1/PDGFRα, PDGFRβ, FGFR1 and JAK2 rearrangements]
Plasma Cell Myeloma	<ul style="list-style-type: none"> Karyotype Myeloma FISH Panel [CDKN2C/CKS1B for chromosome 1q rearrangement, CEP3/7 for hyperdiploidy, monosomy 13/del(13q), p53, IGH/CCND1 with reflex to IGH/FGFR3, IGH/MAF, and IGH/MAFB]
Chronic Lymphocytic Leukemia/ Small Lymphocytic Lymphoma	<ul style="list-style-type: none"> CLL FISH Panel [MYB/CEP6, trisomy 12, p53, ATM, monosomy 13/del(13q), IGH/CCND1] Karyotype
Diffuse Large B-cell Lymphoma	<ul style="list-style-type: none"> FISH for double hit lymphoma all cases [MYC and IGH/MYC; Reflex to BCL2 and BCL6 if MYC rearranged] Karyotype optional
Burkitt Lymphoma	<ul style="list-style-type: none"> [FISH for IGH/MYC with reflex to IGK/MYC and IGL/MYC]
Hairy Cell Leukemia	<ul style="list-style-type: none"> BRAF V600E (send out)
Lymphoplasmacytic Lymphoma	<ul style="list-style-type: none"> MYD88 L265P CXCR4 at request of ordering physician for patient's being considered for ibrutinib
Gastric Malt Lymphoma	<ul style="list-style-type: none"> H. pylori testing (also should be performed in gastric DLBCL) If positive for H. pylori; FISH for t(11;18) will be performed
T-cell leukemia/lymphoma including T-cell Prolymphocytic Leukemia	<ul style="list-style-type: none"> Karyotype T-cell leukemia/lymphoma FISH Panel [TCL1 (14q32), TCRAD (14q11), TCRB (7q434), and TLX3 (5q32) rearrangements; chromosome 8 abnormalities; del(9p)]
Peripheral T-cell Lymphoma and Primary Cutaneous CD30 Positive T-cell Lymphoproliferative Disorders	<ul style="list-style-type: none"> FISH for DUSP22 if ALK negative ALCL consideration (paraffin only)
Other lymphomas	<ul style="list-style-type: none"> Additional cytogenetic and molecular testing is useful under certain circumstances and will be performed at discretion of pathologist; nothing routinely performed or required NHL FISH Panel (IGH/CCND1, IGH/BCL2, MALT1, MYC, BCL6)

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